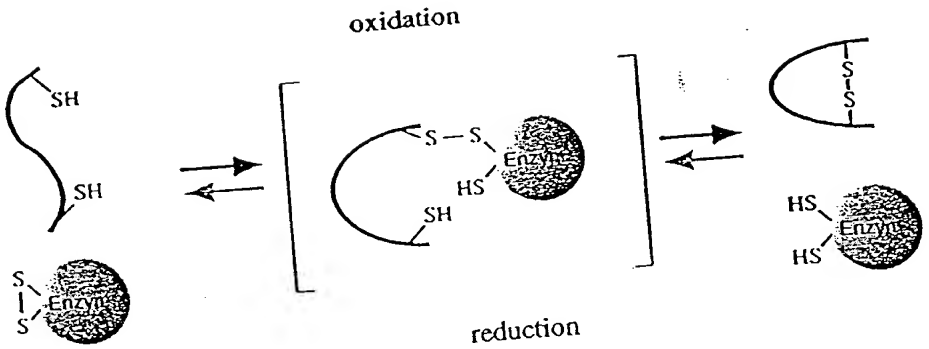
Figure 1



Disulfide Bond Isomerization

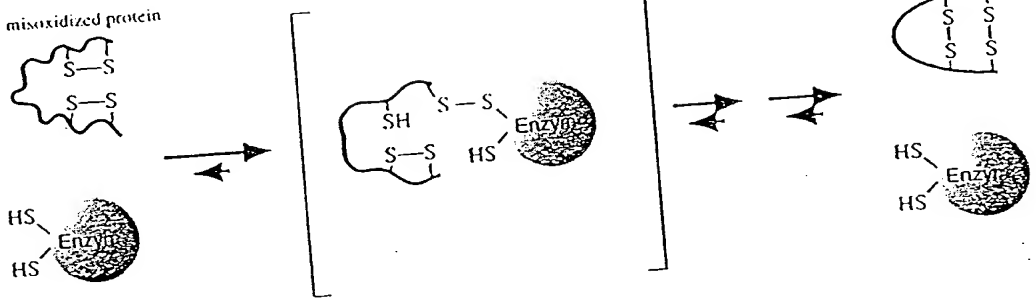


Figure 2

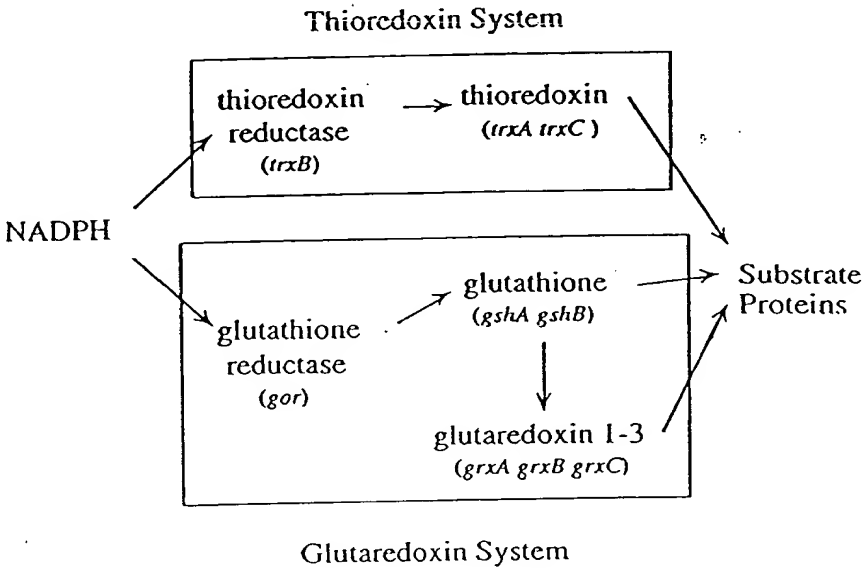

Thioredoxin System
thioredoxin reductase (trxB)
thioredoxin (trxA trxC)
NADPH
glutathione reductase (gor)
glutathione (gshA gshB)
glutaredoxin 1-3 (grxA grxB grxC)
Substrate Proteins
Glutaredoxin System

Figure 3

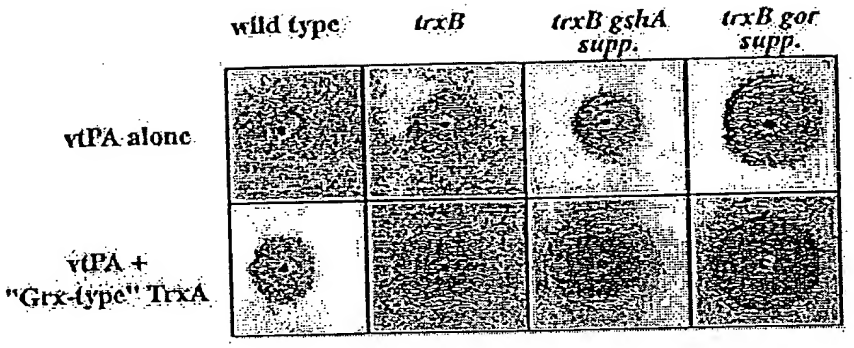

wild type
trxB
trxB gshA supp.
trxB gor supp.
vtPA alone
vtPA + "Grx-type" TrxA

Figure 4

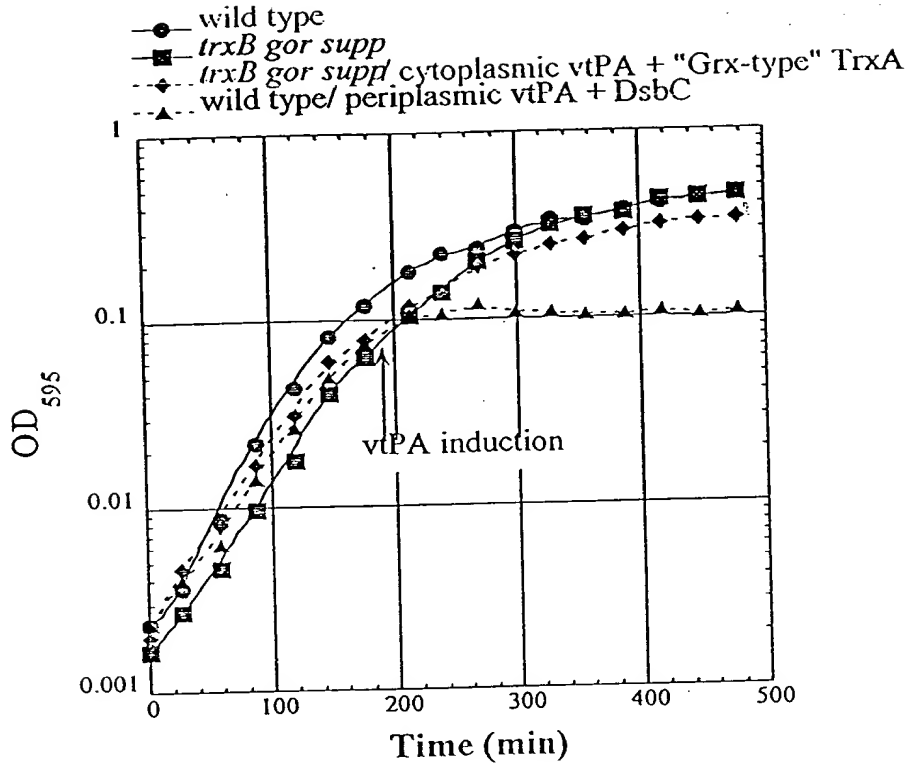

wild type
trxB gor supp
trxB gor supp/ cytoplasmic vtPA + "Grx-type" TrxA
wild type/ periplasmic vtPA + DsbC
1
0.1
0.01
0.001
OD595
vtPA induction
0
100
200
300
400
500
Time (min)

Figure 5

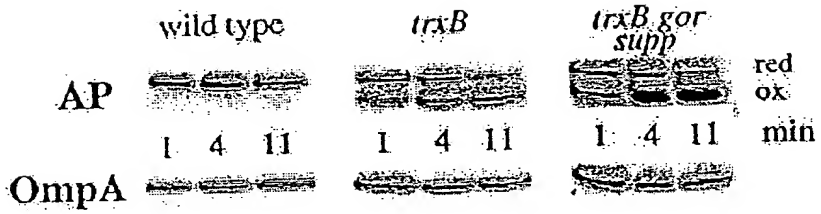


Figure 6

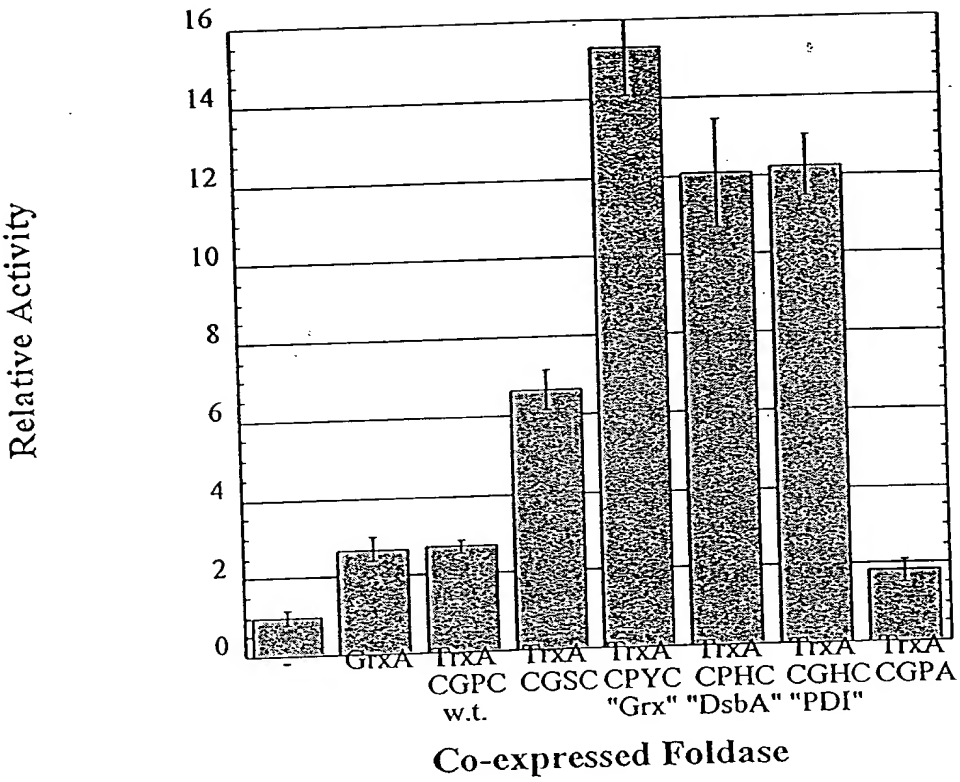
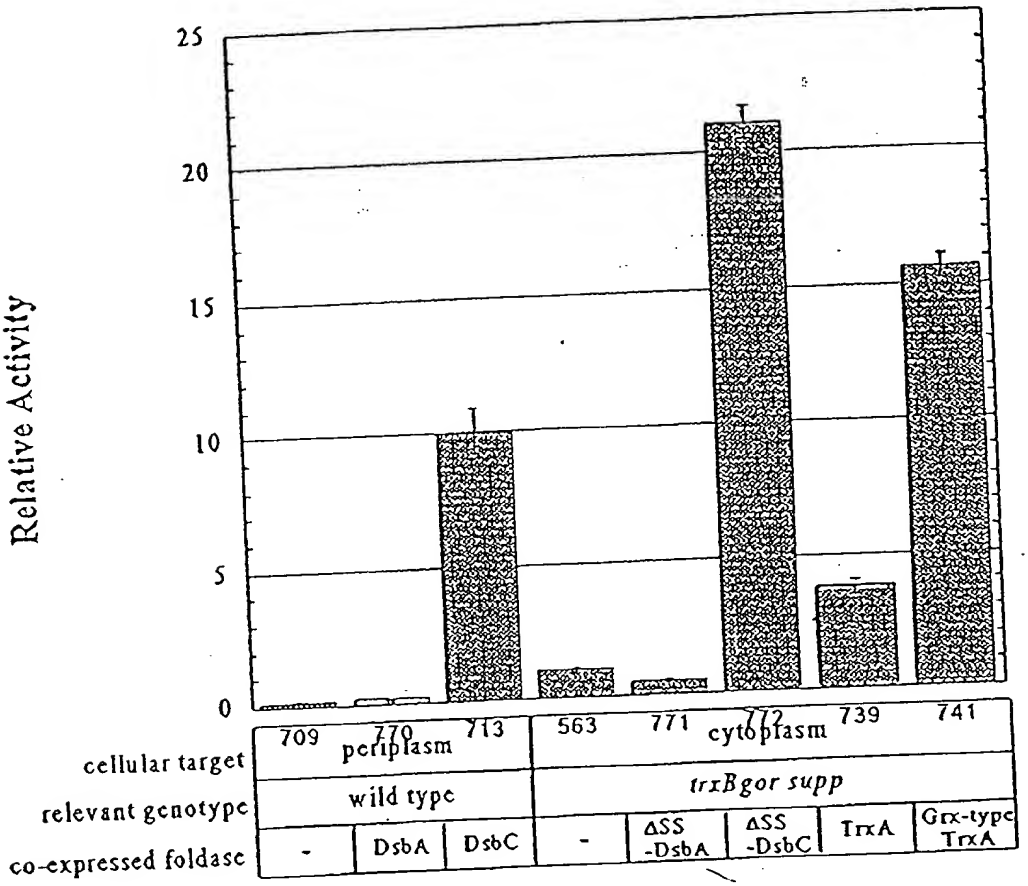
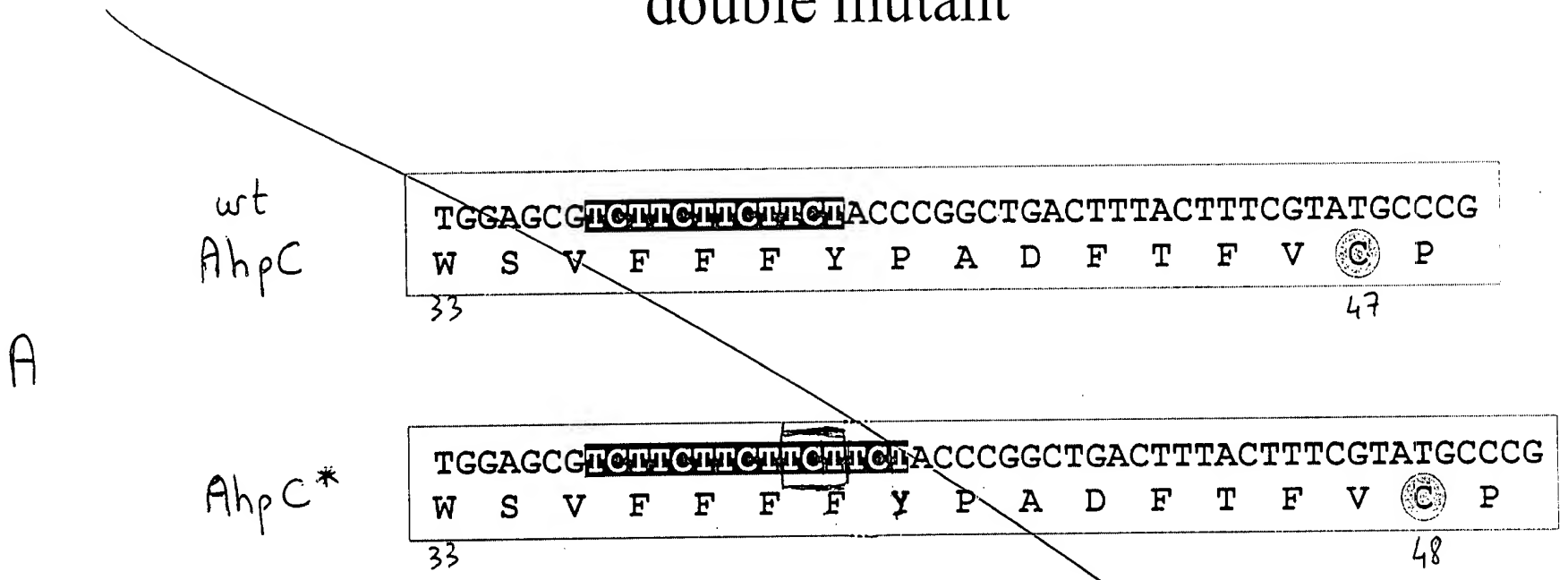

Relative Activity
16
14
12
10
8
6
4
2
0
-
GrxA
TrxA CGPC w.t.
TrxA CGSC
TrxA CPYC "Grx"
TrxA CPHC "DsbA"
TrxA CGHC "PDI"
TrxA CGPA
Co-expressed Foldase

Figure 7


Relative Activity
25
20
15
10
5
0
709
770
713
563
771
772
739
741
periplasm
cytoplasm
cellular target
relevant genotype
co-expressed foldase
wild type
trxBgor supp
-
DsbA
DsbC
-
ΔSS -DsbA
ΔSS -DsbC
TrxA
Grx-type TrxA

A triplet insertion in a *ahpC* restores growth to a *trxB gor* double mutant

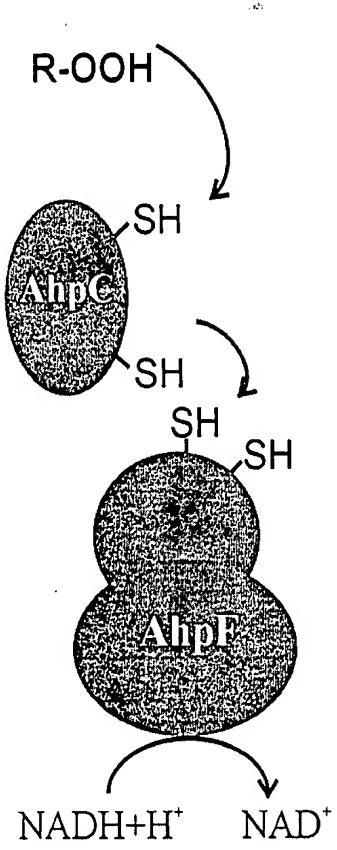


B

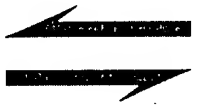
E. coli	32	RWSVFFFYPADFTFVCPTELGDVADHYEELQK
S. typhi	32	RWSVFFFYPADFTFVCPTELGDVADHYEELQK
P. putida	32	KWSVVFFYPADFTFVCPTELGDLADNYAEFQK
S. mutans	32	KWAVFCFYPADFSFVCPTELGDLQEQYATLQS
B. subtilis	32	QWSVFCFYPADFSFVCPTELEDLQEQYAALKE
S. aureus	34	SWSVVCFYPADFSFVCPTELEDLQNQYEELQK
T. pallidum	33	SWAVFMFYPADFTFVCPTELADLARVYPSFVE
A. aeolicus	50	KWVILFFYPADYTFVCPTELADLAEKYDELKE
HUMAN_TPA	36	KYVVLFFYPLDFTFVCPTEIIAFTTVKRTSAK

Figure 8

Depending on the oxidative stress-inducing signal two different forms of AhpC can be found



Peroxide stress



Disulfide stress

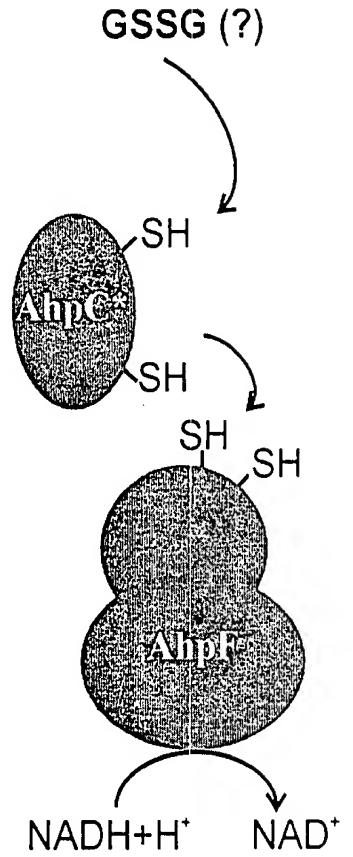


Figure 9

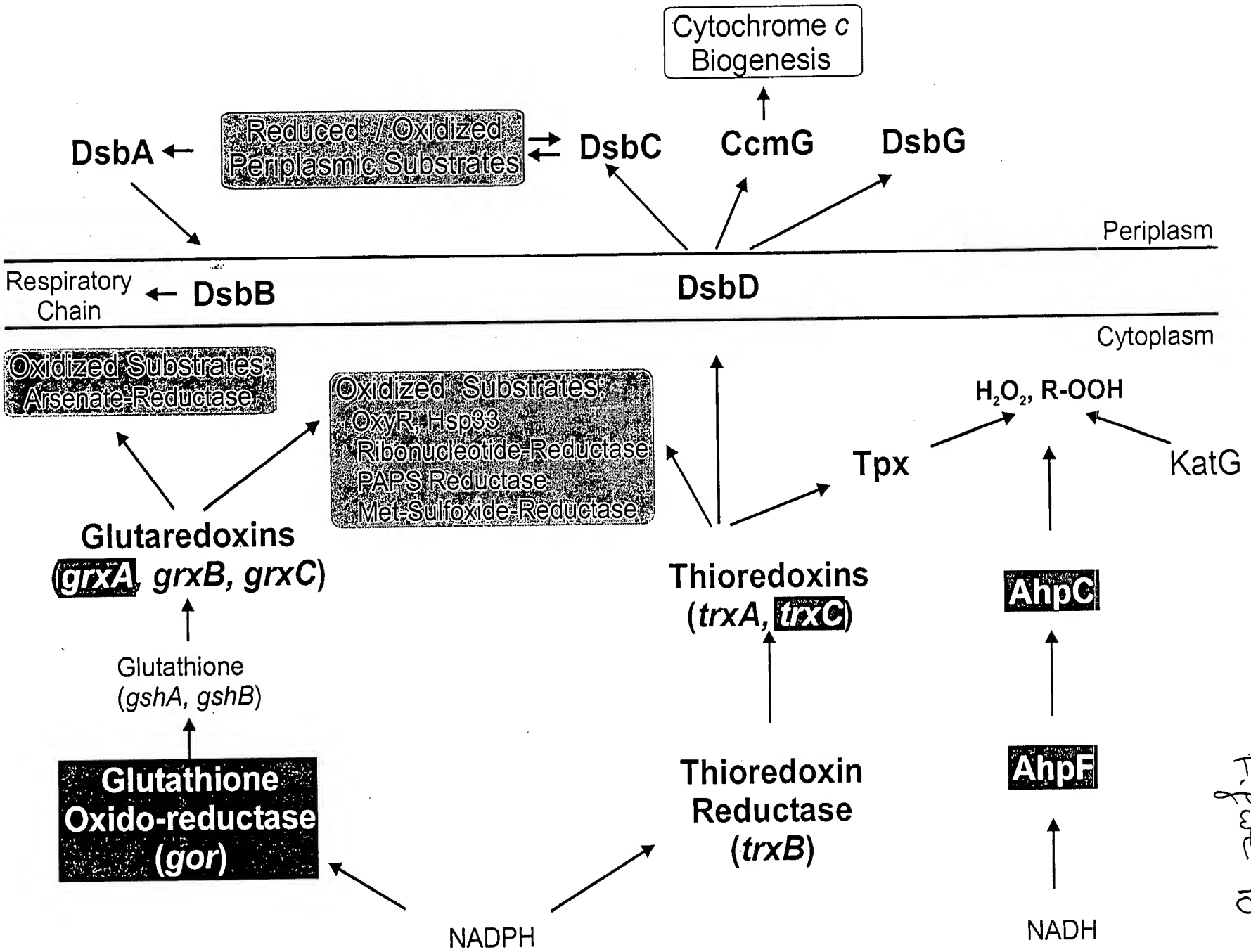

Cytochrome c Biogenesis
DsbA
Reduced / Oxidized Periplasmic Substrates
DsbC
CcmG
DsbG
Periplasm
Respiratory Chain
DsbB
DsbD
Cytoplasm
Oxidized Substrates: Arsenate-Reductase
Oxidized Substrates: OxyR Hsp33 Ribonucleotide-Reductase PAPS Reductase Met-Sulfoxide-Reductase
H2O2, R-OOH
Tpx
KatG
Glutaredoxins (grxA, grxB, grxC)
Thioredoxins (trxA, trxC)
AhpC
Glutathione (gshA, gshB)
Glutathione Oxido-reductase (gor)
Thioredoxin Reductase (trxB)
AhpF
NADPH
NADH

Figure 10

Thiol-Redox pathways in a *trxB gor* double mutant

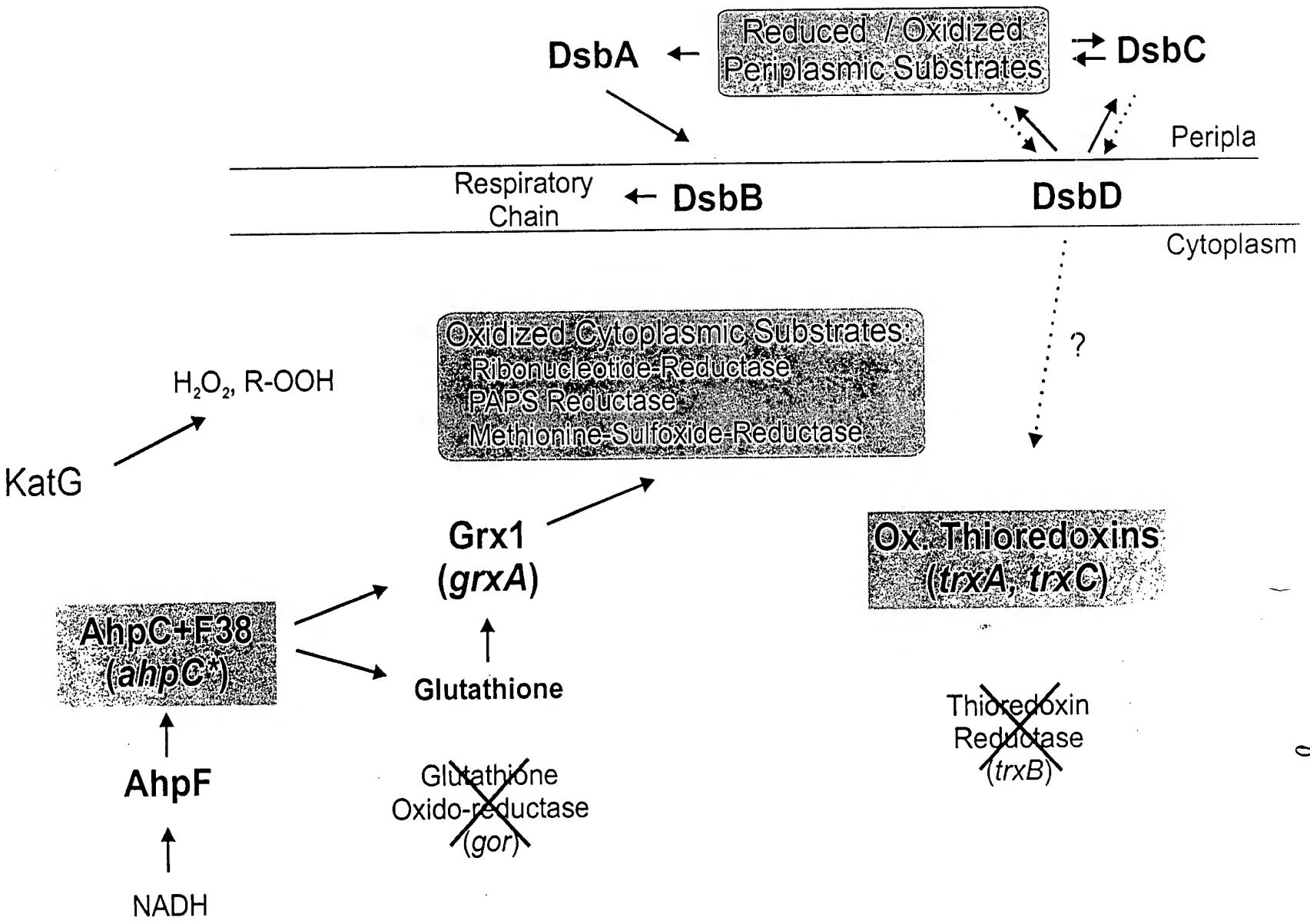


Figure 11